An Overview of
User Engineering

Tire Kicking

Usability Testing → **Identify Problems + Predict Acceptance** → **Gain Attention**

Usability

< 90's

User Driven

Design Process → **Multi-Disciplinary Team + Iterative Design & Test** → **User Satisfaction**

UCD Process

Usability

< 90's   **Mid 90's**

Productivity

Assist ➔ **Proven Methods + Integrated Workbench** ➔ **Reduced Cost & Time**

Usability

UCD Process

UCD Workbench

< 90's **Mid 90's** **Late 90's**

Overall Value

Business Value → **Supplier & User Measures + Engineering Rigor** → **ROI**

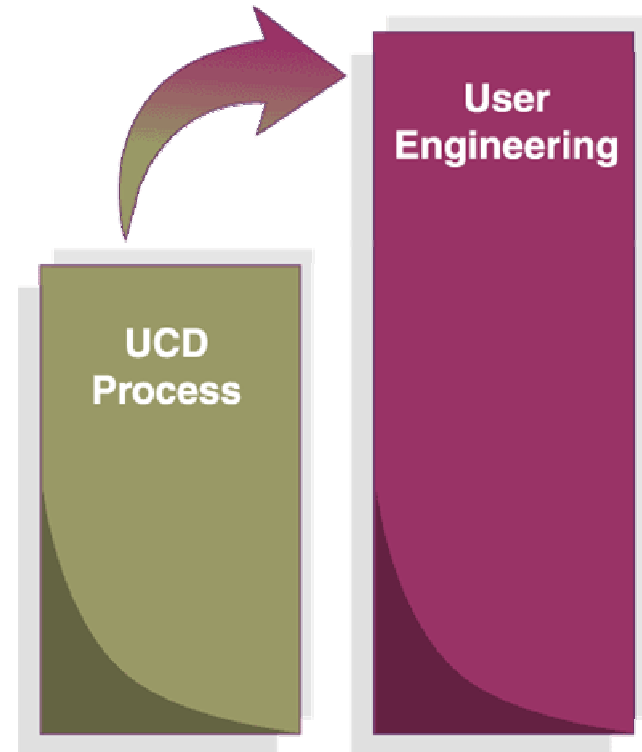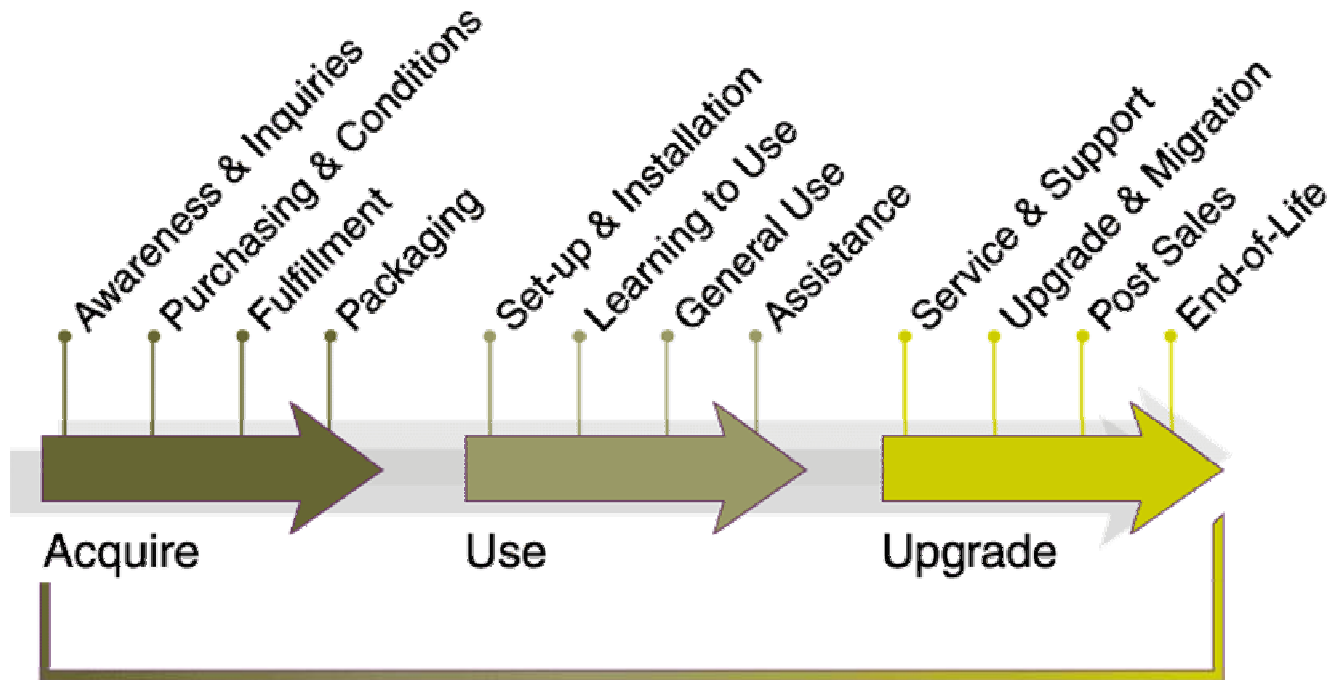| Usability	UCD Process	UCD Workbench	User Engineering
< 90's	Mid 90's	Late 90's	2002 >
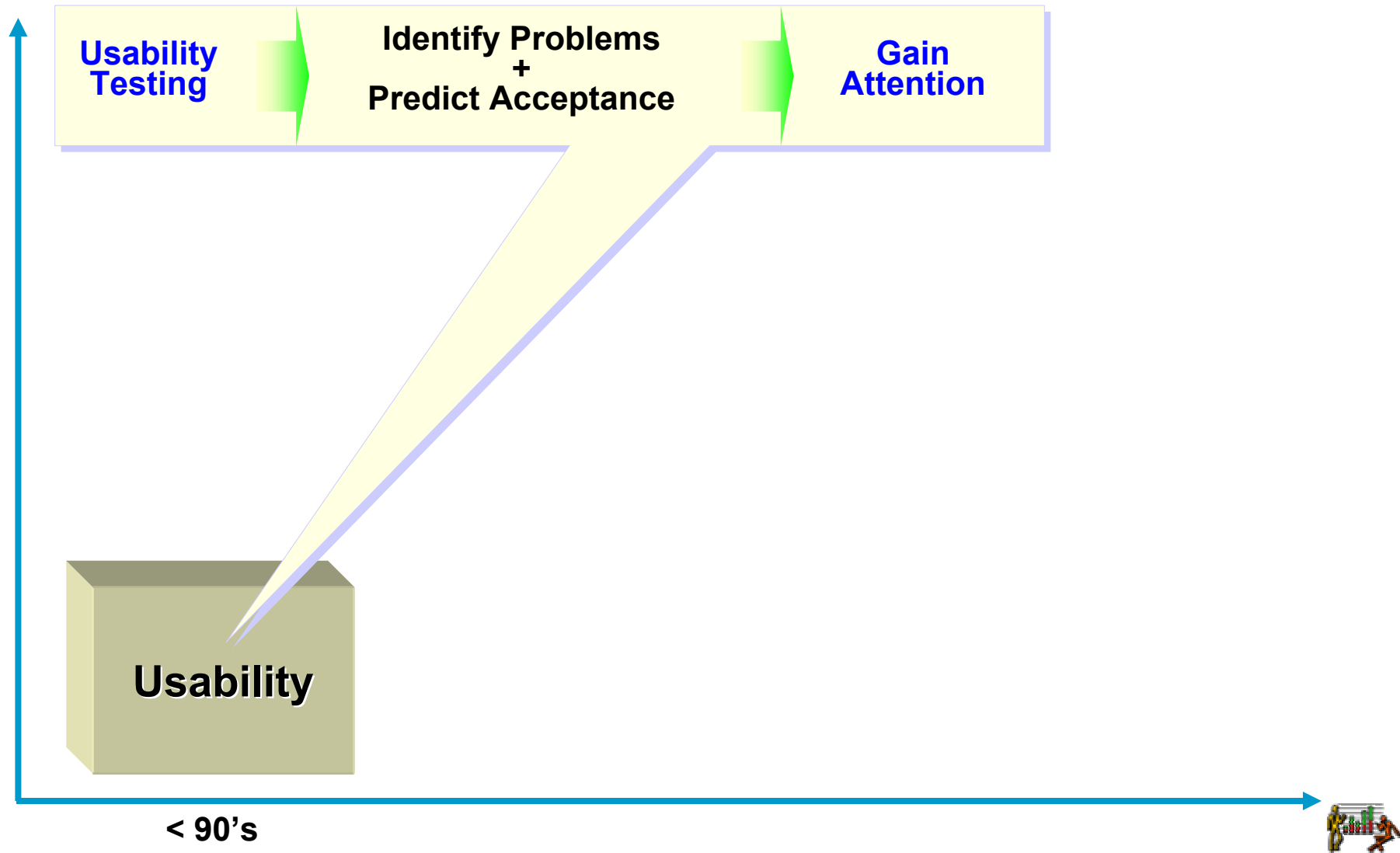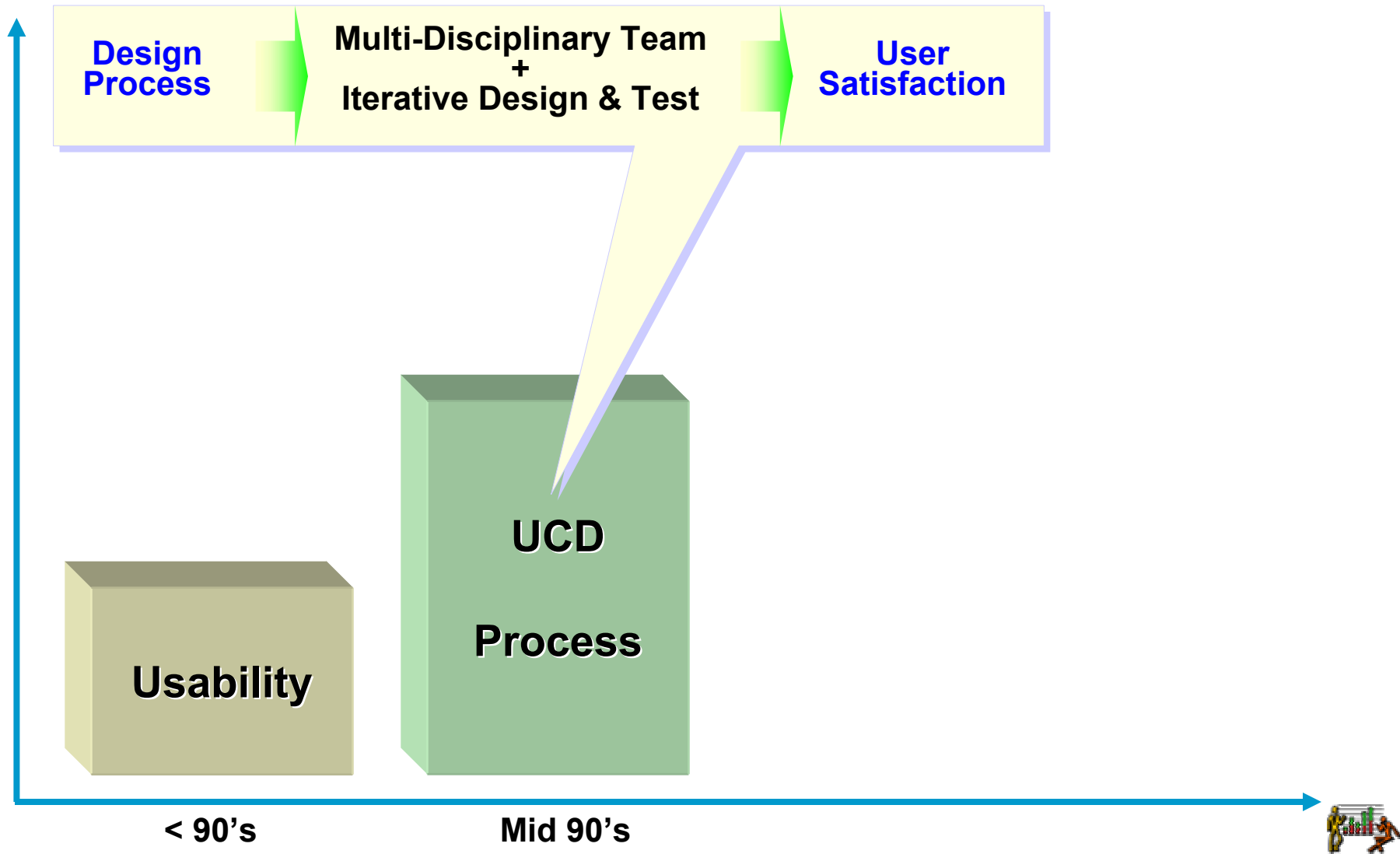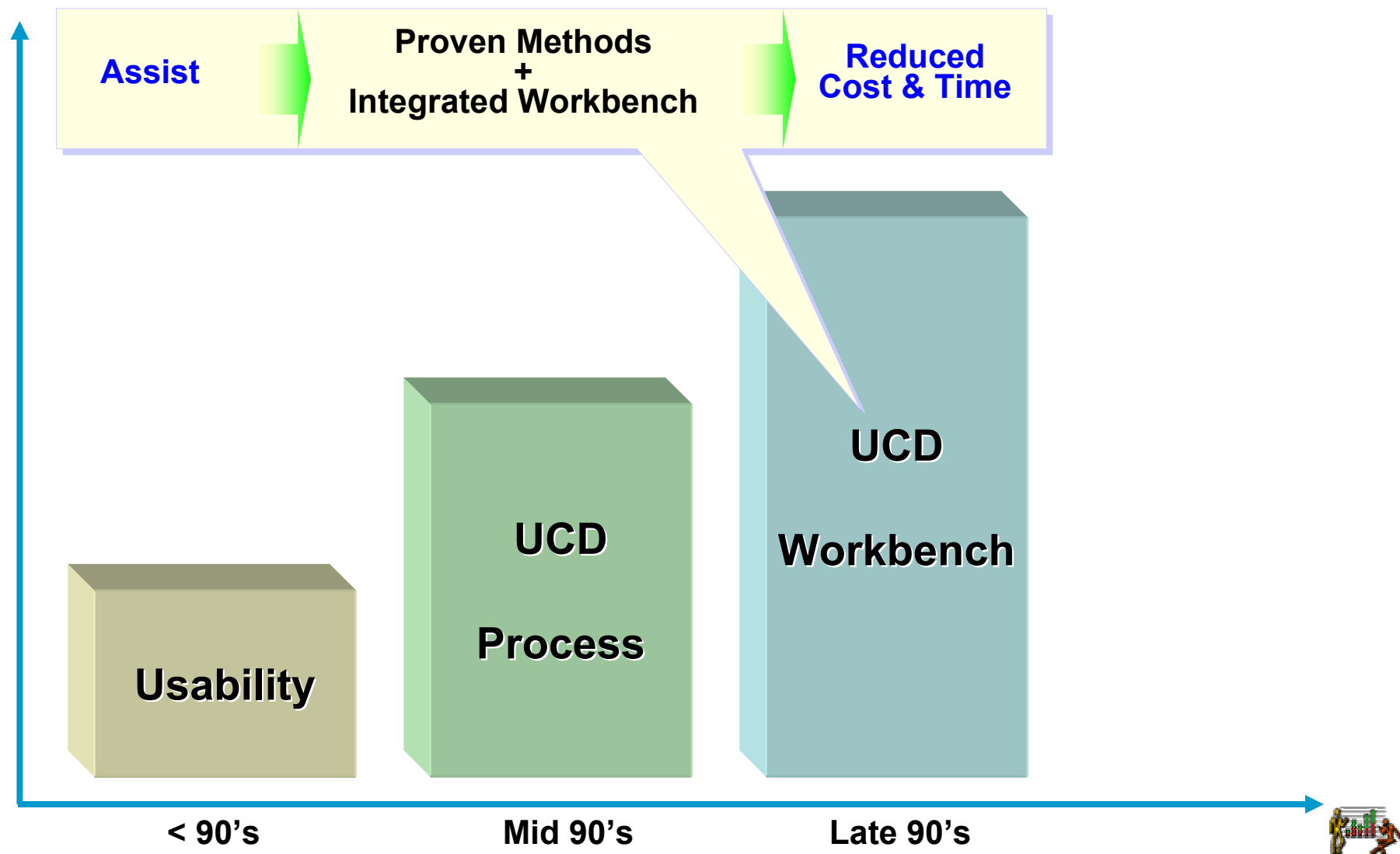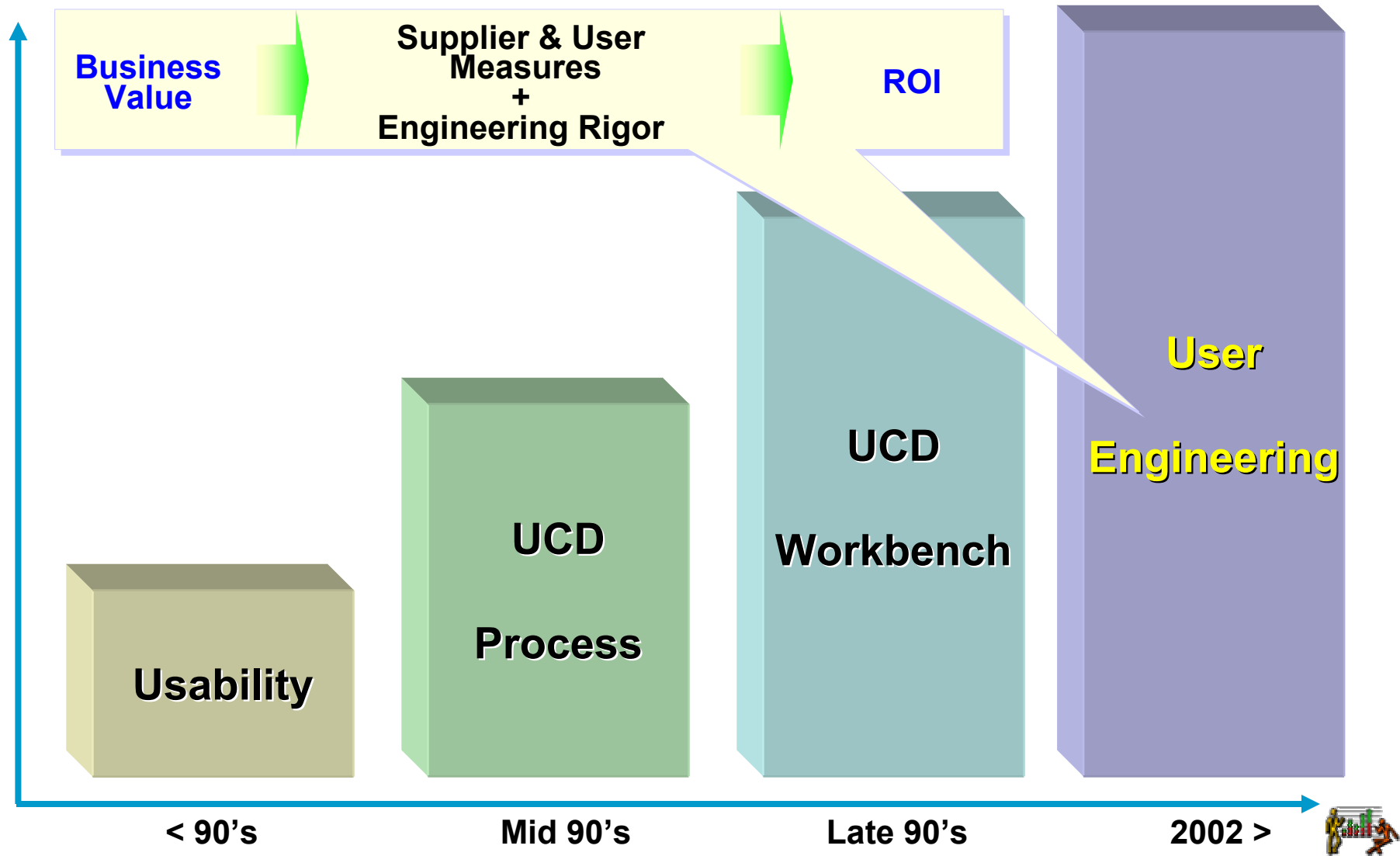
Making a Quantum Leap: UCD to UE

- Core characteristics of
User Engineering:

  Based on business goals

  Executive involvement

  Defined Roles and Skills

  Prescribed Activities and
      Work Products

  Design occurs in distinct Phases

  User groups, goals, success
      criteria based on research

  Rigor and structure

  Integrated Methods

  Tangible Measures and targets
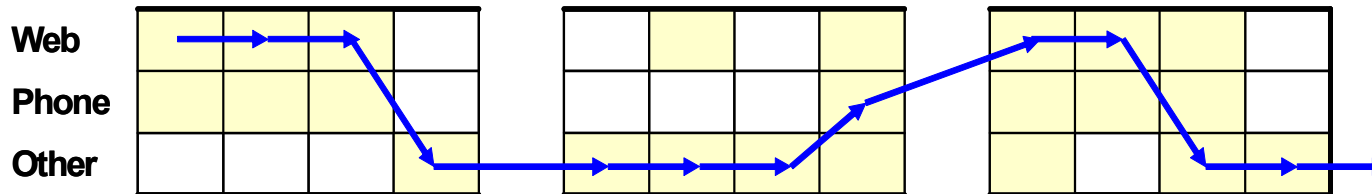
The Total User Experience

Awareness & Inquiries
Purchasing & Conditions
Fulfillment
Packaging
Set-up & Installation
Learning to Use
General Use
Assistance
Service & Support
Upgrade & Migration
Post Sales
End-of-Life

Acquire Use Upgrade

Total User Experience

- By User Group
- By type of offering

Web
Phone
Other

User Engineering Elements

Principles	Fundamentals that govern its structure and practice.
Roles	Core skills needed to design the user experience
Phases	Discrete periods of the User Engineering cycle
Activities	Work performed by the specific roles that contribute to Work Products
Work Products	Artifacts that represent the results of the various User Engineering activities
Methods	Proven techniques to help perform Activities
Measures	Various quantifiable attributes of the design

Principles of User Engineering

Design decisions are based on relevant, timely information about the market, business, and users.
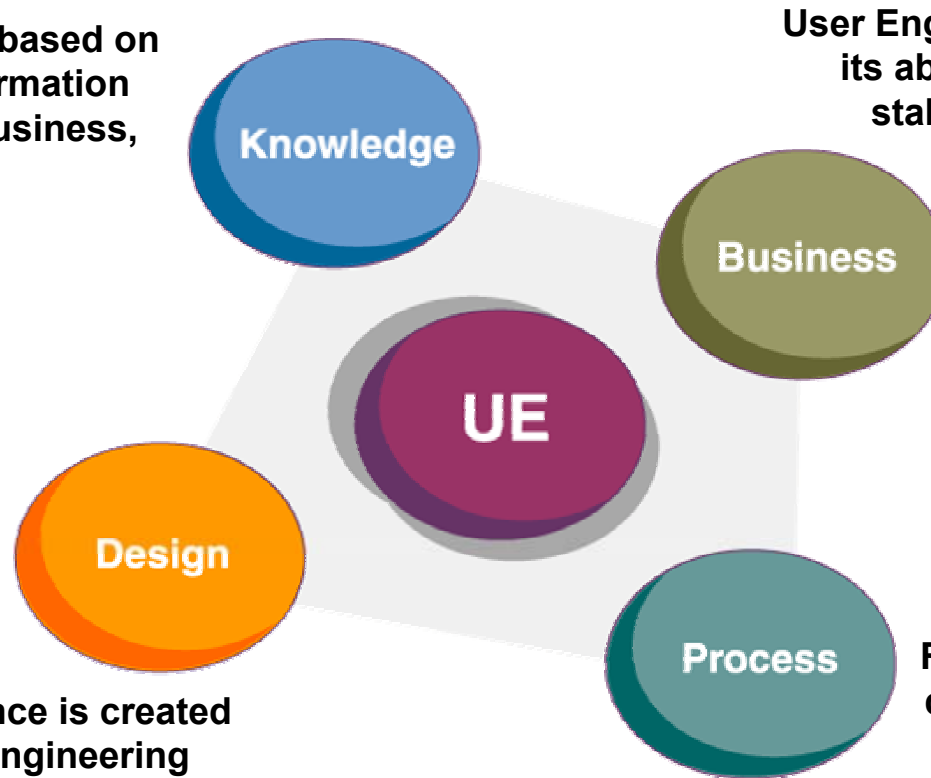
User Engineering is predicated on its ability to deliver value to stakeholders and users.

Knowledge

Business

UE

Design

Process

Design follows a systematic approach: Roles perform Activities in distinct Phases that result in the production of Work Products.

The total user experience is created through the use of engineering methods and tools, applied by a team of skilled experts, with continuous evaluation and tracking of measures against targets.

Delivers Value

		Baseline		Competitor		Target
Site visitors per month		20,000		20,000		20,000
Visitor growth per year	0%		5%		10%	
Site visitors per year		240,000		252,000		264,000
Wish to purchase	10%	24,000	12%	30,240	15%	39,600
Find what they want	50%	12,000	60%	18,144	70%	27,720
Acceptable delivery date	75%	9,000	80%	14,515	85%	23,562
Able to complete purchase	70%	6,300	80%	11,612	90%	21,206
Notional Spend		$250		$250		$250
Total revenue		$1,575,000		$2,903,040		$5,301,450
Additional revenue				$1,328,040		$3,726,450
% Increase				184%		337%
Conversion Rate		26%		38%		54%

Targets

Team Roles

Delivers proven value to all stakeholders, especially the sponsor and users

Provides accurate, timely, and cost-effective evaluations of evolving design

Provides a comprehensive definition of the business and market expectations

Creates a physical, emotional experience that presents the brand while engaging and delighting users

Provides a comprehensive understanding of the user domain (roles, goals, tasks)

- User Experience Leadership
- Market Planning
- User Experience Evaluation
- UE Team
- User Research
- Visual/Industrial Design
- User Experience Design

Creates a leading, intuitive user experience that satisfies business, market, and user requirements

Phases

- Six distinct periods of the UE process in which specific activities are performed
  - Correspond to typical development process phases

- Defined in terms of the design activities that are performed and the Work Products that are created

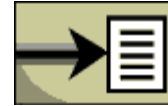| Pre-Concept	Concept	Plan	Develop	Qualify & Launch	Life-Cycle
Business Opportunity	**Understanding Users**	**Initial Design**	**Development**	**Deployment**	**Life-Cycle**
The team identifies a market opportunity and relates it to business goals.	The team performs a comprehensive analysis of user needs.	The team sets forth a conceptual design that reflects every aspect of the total user experience.	The team completes a specification of the actual detailed design.	The team performs a final validation of the implemented design.	The team gathers feedback to assess the final offering.

UML and User Engineering
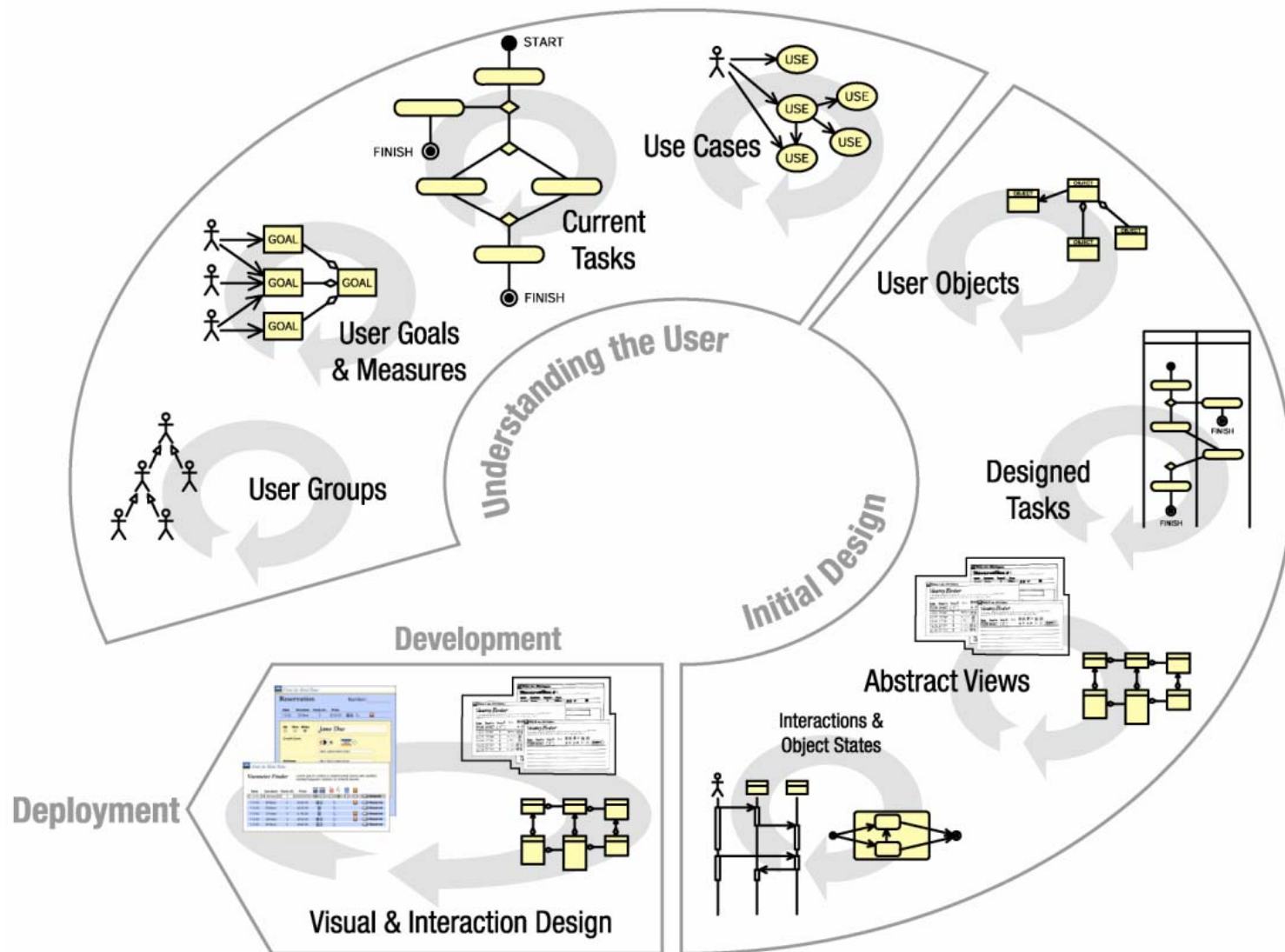
From Users to Designers
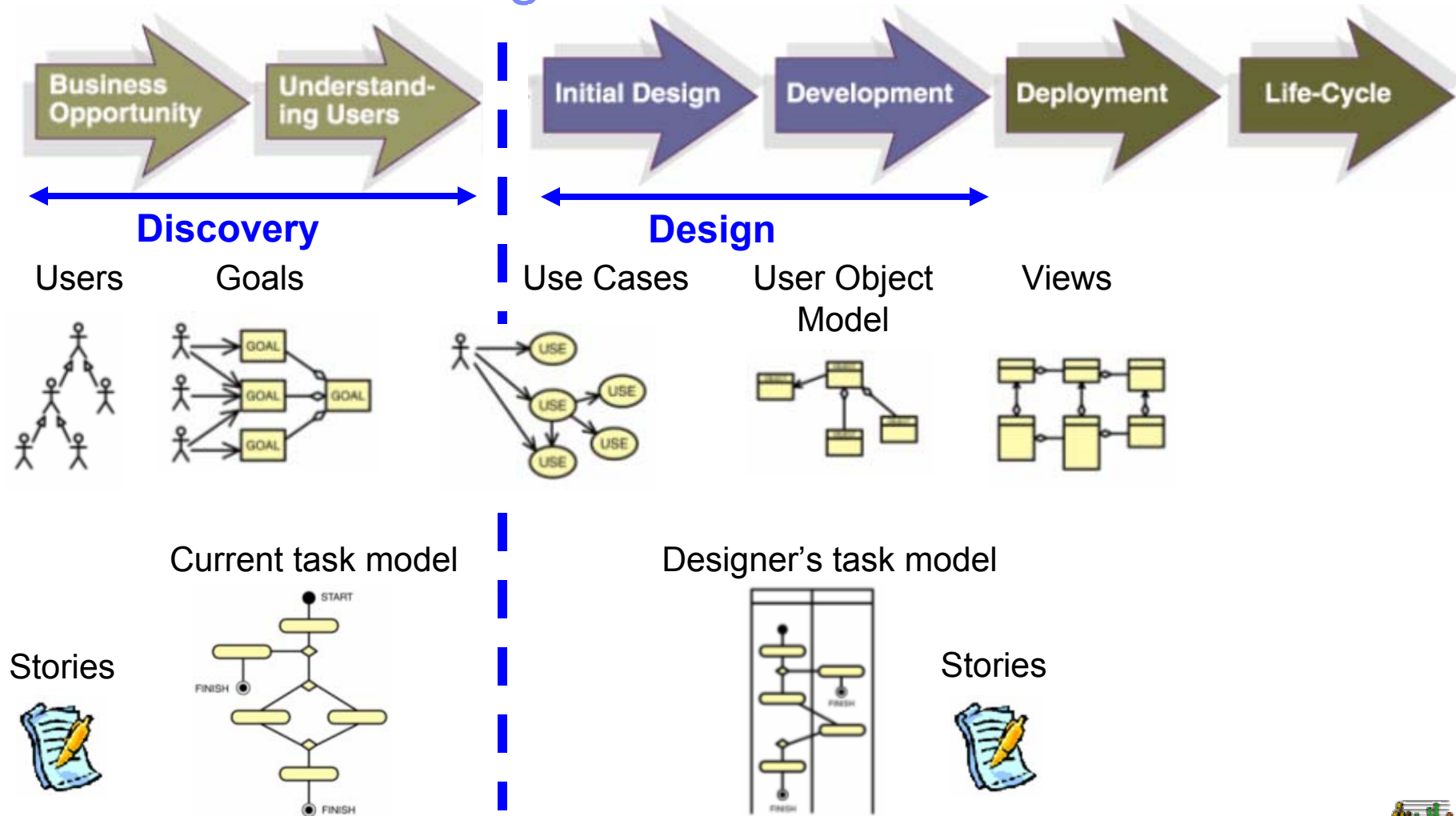
Activities and Work Products

- **Activities create Work Products**
  - Multiple Actions

- **Examples include:**
  - Market Requirements
  - User Evaluation

- **Work Products are defined in terms of…**
  - Content
  - Purpose
  - Role that leads to creation
  - Roles that assist in its creation
  - Phase in which it is created
 - Roles that will use it

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→ Market Requirements

Overview: A comprehensive outline of market factors that will drive the design

Purpose: Provide market insights as the basis for user research

Led by:
- Market Planning

Used by (primary):
- User Experience Leadership
- User Research

Used by (secondary):
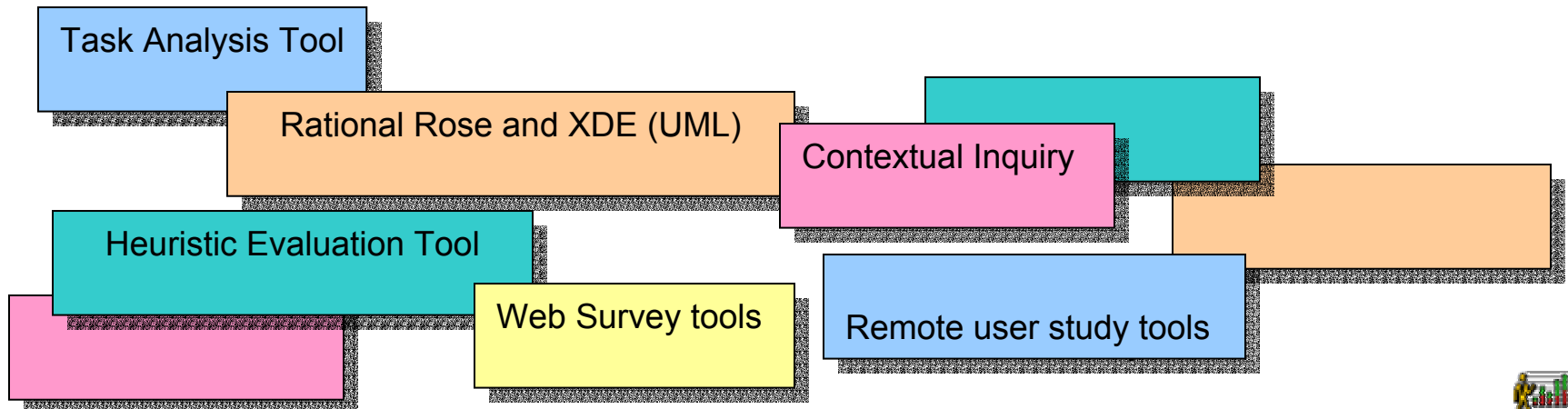- All Roles

Created during:
- Business Opportunity

Content by Activity:
- Define Market Requirements
  - ☑ market characterization including opportunity, trends, and anticipated users
  - ☑ the value proposition in terms of factors such as price/value, availability, packaging, performance, ease-of-use, customer assurance, life-cycle costs, and social impact
  - ☑ buyer characteristics including behavior, wants and needs, decision processes, buying criteria
  - ☑ competitive posture including key competitors, their perceived strengths and weaknesses, and positioning of the proposed offering
  - ☑ environmental factors including economic, industry, demographic, political, and social

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Methods

- Activities are comprised of multiple Actions
- Many Actions use a proven Method
- Tools are frequently provided to perform a Method
- Some Methods are well-known industry-standards
- Some are implemented in industry-standard tools
- Some are crafted specifically for IBM's process
- Much of the rigor of UE is achieved through the methods

Task Analysis Tool

Rational Rose and XDE (UML)

Contextual Inquiry

Heuristic Evaluation Tool

Web Survey tools

Remote user study tools
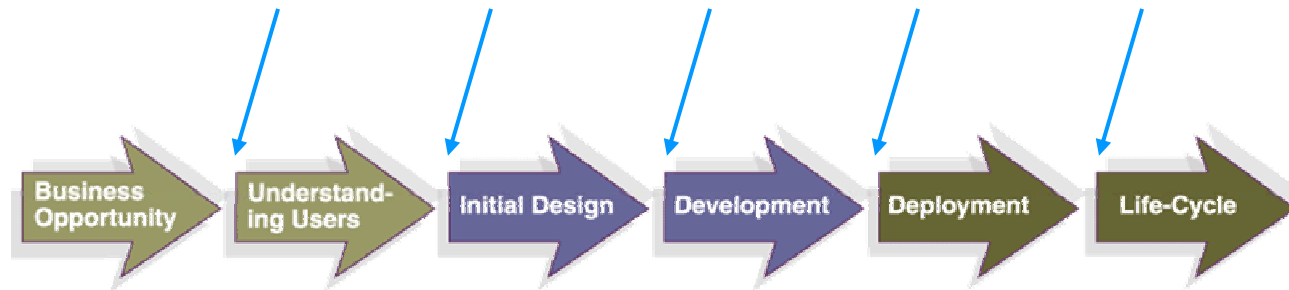
Measures

- Aspects of the design that can be quantified and tracked
  - Used to assess achievement of goals
  - Subjective
  - Objective

- *Examples include:*
  - *User Satisfaction (attributes)*
    - *Function, ease of use, reliability…*
  - *Productivity*
    - *Task time, error rate…*

- Targets are set early, and assessed throughout the process

Checkpoints

- Ensures that the current phase is complete

- Assesses whether the project is on track

- Makes sure everything is in place for the next phase

Business Opportunity → Understand-ing Users → Initial Design → Development → Deployment → Life-Cycle

- *All Work Products complete*

- *Targets for measures have been met*

User Engineering summary

- User Engineering…
  - ✓ is a rigorous approach to design and development
  - ✓ emphasizes fully-understood requirements before starting design
  - ✓ prescribes doing conceptual design before describing mechanisms
  - ✓ specifies roles, activities, phases, work products, methods, and measures
  - ✓ is driven by business goals
  - ✓ focuses on the Total User Experience
  - ✓ represents a quantum leap forward from usability and UCD
  - ✓ is based on business goals, executive involvement, rigor and structure, and targets
  - ✓ continually evaluates the design against business and user goals

Thank you!